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NATURAL DISASTER REDUCTION: WARNING SYSTEMS

Technical session

Addendum

Earthquakes and tsunamis: ways of reducing risk

Summary of presentation by Messrs. Emilio Lorca and Hugo Gorziglia, Servicio Hidrografico y Oceanografico de la Armada de Chile

1. Earthquakes occur along tectonic plate boundaries. In the past 500 years, 3 million people have died in major earthquakes. The rapid growth in population and industrial and harbour facilities increase the risks posed by earthquake and tsunami hazards. Tsunamis triggered by undersea earthquakes or volcanic eruptions have killed some 52,000 people around the Pacific basin in the past 100 years. Systems that warn populations of an approaching tsunami must work quickly since most deaths caused by the tsunami waves occur in the first 20 minutes and less than 100 kilometres from the source. Recent tsunamis which occurred in Nicaragua, Indonesia and Japan in 1992 and 1993, with hundreds of victims, have shown that actual tsunami warning systems do not provide sufficient lead time to save human lives within the near field.

2. In 1966, IOC established the International Co-ordination Group for the Tsunami Warning System in the Pacific, which identified the Seismic Sea-Wave Warning System of the United States of America, in operation since 1948 at the

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Seismological Observatory near Honolulu, as the Pacific Tsunami Warning Center (PTWC). The operational objectives of PTWC is to detect and locate major earthquakes in the Pacific region, to determine whether they have generated tsunamis, and to provide timely and effective tsunami information and warnings to the population of the Pacific in order to minimize the hazards of tsunamis, especially to human life and welfare.

3. No such warning system exists as yet for major earthquake occurrence. Monitoring by a large number of instruments throughout the world is supporting and encouraging the research efforts aimed at the development of forecasting techniques for appropriate application in regard to time and place.

4. There are several ways of reducing risk from tsunami hazards. On is by assessing vulnerability, which can be attained through two methods: evaluation of historical impact from tsunamis and numerical simulation. Tsunami risk is essentially a function of land uses interacting with tsunami characteristics. There are two approaches to tsunami risk reduction: construction of barriers and risk management policies.

5. The development of regional and national tsunami warning centres using new operational concepts will reduce the time needed to evaluate the tsunami hazard, to make decisions and to disseminate the warnings.

6. Most of the mentioned risk reduction measures are expensive and take a lot of time to implement. The developing countries at risk, most of which are located at the rim of the Pacific basin have a better chance of reducing earthquakes and tsunami hazard through a comprehensive education programme on both of those natural hazards.